REMARKS

By this amendment, claims 1-4, 6-25 are pending in the application, of which claims 1, 11 and 18, are being amended, and claim 5 is being cancelled.

The amendments claims to 1, 11 and 18, are fully supported by the originally filed claim 5 and the Specification and add no new matter. Entry of the amendments and reconsideration of the present case is respectfully requested.

Rejection Under 35 U.S.C. 103(a)

I. **The Examiner rejected claims 1-5, 7, 8, 11-15 under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (USP 6,423,949) in view of Chang (USP 5,916,370) or Berkman et al. (USP 4,090,851), and Brown et al. (USP 6,046,758) or Todd (US 6,630,413).**

Claims 1-10

As amended, claim 1 is to, inter alia, a substrate support for substrate processing chamber, the substrate support comprising an aluminum nitride ceramic block having a substrate receiving pocket, a ceramic coating comprising an amorphous Si-H-N-O compound, a resistance heater in the ceramic block, and heater leads extending out of the ceramic block to conduct electrical power to the resistance heater.

Chen et al. does not teach or suggest use of a coating on a ceramic block having a heater, and further, as acknowledged by the Examiner, Chen et al. "does not show the claimed ceramic coating comprising an amorphous Si-H-N-O compound." Chen et al. discloses that a susceptor having an exposed surface of AlN without any coating works fine in a plasma environment. (Col. 7, lines 50-60.) Thus, Chen et al. would not motivate one of ordinary skill to seek a coating for the disclosed AlN

susceptor because there is no teaching that the exposed AlN surface has any problems. Consequently, one of ordinary skill would not be motivated to seek other references that teach a coating, such as the Chang and Berkman et al. references identified by the Examiner and apply these references to the susceptor taught by Chen et al. Such a reconstruction of the invention is only possible by identifying a problem, which is not identified by the primary reference of Chen et al., in hindsight, and based on the instant claims and disclosure.

Furthermore, Chang's teachings to a susceptor having a protective diamond film coating, does not support a rejection of claims to a support with a coating of amorphous Si-H-N-O compound. Neither Chen et al. nor Chang teach or suggest the claimed amorphous Si-H-N-O compound coating. A teaching that a diamond film provides a protective function does not motivate one of ordinary skill to apply a coating of amorphous Si-H-N-O compound. Thus, because Chen et al, does not suggest that any coating is needed for an aluminum nitride block, and because Chang teaches a different coating than the one claimed, the combination of the two references simply does not support an obviousness rejection. Chang does not cure the deficiencies of Chen et al. to the absence of any coating motivation, and does not teach or suggest the claimed coating.

In fact, Chang specifically teaches that exposed silicon nitride is undesirable in the chamber because "the silicon nitride may flake and introduce unwanted particulates into the processing chamber." (Col. 1 lines 39-41.) Thus, Chang teaches against a protective coating of amorphous Si-H-N-O compound as claimed. A reference that teaches against the claimed invention cannot be relied upon in an obviousness rejection.

Furthermore, Chang does not teach a ceramic block that includes the resistance heater or heater leads extending out of the ceramic block to conduct electrical power to the resistance heater. Chang teaches an annular pre-heat ring made of silicon carbide coated with graphite or quartz, but the annular pre-heat ring does not

include a resistance heater or have heater leads extending out of a ceramic block.

Berkman et al. is non-analogous art because Berkman et al. teaches the art of forming die crucibles, which is non-analogous to the art of substrate supports for substrate processing chambers. Thus, Berkman's teachings to a protective coating of silicon nitride over a ceramic die crucible do not cure the deficiency of a lack of disclosure of the need for a coating in Chen et al., and more specifically to the claimed amorphous Si-H-N-O compound on a substrate support for a substrate processing chamber. Chen et al. does not motivate one to seek any protective coating. Chang teaches against the claimed amorphous Si-H-N-O compound. Berkman teaches coatings for an entirely different art than a substrate support for a substrate processing chambers. Thus Berkman does not cure the deficiencies of Chen et al. or Chang.

Brown et al. is also non-analogous art because Brown et al. teaches wear resistant thermal print heads with silicon-doped diamond-like carbon protective coatings. (Abstract.) One of ordinary skill in the art would not be motivated to use a coating used to reduce wear in a thermal print head to reduce contamination from a substrate support for substrate processing chamber. The thermal print head is used to print images in paper and related media. One of ordinary skill in the art would not be motivated to use a coating used to reduce wear in a thermal print head to reduce contamination from a substrate support for substrate processing chamber. Not only are the technical fields different, but the end application of reducing wear versus reducing contamination are also completely different. Furthermore, the print head is not a substrate support and does not have a substrate-receiving pocket that is sized to receive a substrate. Nor does Brown et al. teach an aluminum nitride ceramic block. Thus, Brown et al., also does not support an obviousness rejection in combination with Chen et al.. Chen et al. does not recognize or teach the need for a protective coating on a substrate support and Brown teaches coatings for a thermal print head to reduce wear; derivation of the claimed invention from this combination is not a valid obviousness rejection.

The next reference, Todd, generally teaches CVD synthesis of silicon nitride materials containing low hydrogen content by CVD to make micro electronic devices such as integrated circuits. (Column 2, lines 55-67.) Todd provides no teaching or motivation to apply an amorphous protective coating comprising Si-H-N-O compound to a substrate support for substrate processing chamber to reduce contamination of the substrate placed on the chamber as taught in the instant Specification. A teaching to a method of fabricating a type of coating is not a teaching to a component comprising a coating used for a particular application, as claimed. The reference should provide some motivation or teaching that would cause one of ordinary skill in the art to apply the coating methods taught by the reference, to the particular product being claimed. Thus, Todd et al also does not teach or suggest the instant claims.

Claims 11-15 and 17

Claim 11 is to, inter alia, a substrate support comprising an aluminum nitride ceramic block having a substrate receiving pocket, a silicon nitride compound coating covering the substrate pocket and peripheral ledge of the block; a resistance heater in the block; and heater leads extending out of the block to conduct electrical power to the resistance heater.

Chen et al. does not teach the silicon nitride compound coating covering a substrate-receiving pocket of an aluminum nitride ceramic block. There is no teaching a suggestion in Chen et al. that a coating is desirable. Nor does Chen et al. teach that a coating may be used to reduce contamination from a substrate support as disclosed in the present Specification. In addition, Chen et al. provides no mention of the claimed silicon nitride compound coating. Thus, one of ordinary skill in the art would not be motivated to seek coating references to apply to the substrate support taught by Chen et al.

Chang does not support the deficiencies of Chen et al., because Chang also does not disclose a substrate support comprising a silicon nitride compound

coating on a ceramic block. Instead Chang discloses a totally different coating of diamond. Furthermore, Chang does not teach a ceramic block that includes the resistance heater or heater leads extending out of the ceramic block. Moreover, Chang specifically teaches that exposed silicon nitride is undesirable in the chamber because "the silicon nitride may flake and introduce unwanted particulates into the processing chamber." (Col. 1 lines 39-41.) Thus, Chang teaches against a protective coating of silicon nitride compound as claimed, and thus, should not be relied upon in this obviousness rejection.

Nor do Berkman's teachings, which are first of all in a non-analogous art, and second directed to a protective coating on a ceramic die crucible, cure the deficiencies of the lack of disclosure in Chen et al. or Chang. The art of forming die crucibles is non-analogous to the art of substrate supports for substrate processing chambers, thus, one of ordinary skill in the art would not seek out literature for the fabrication of die crucibles to solve a contamination problem in a substrate processing chamber. Furthermore, Chen et al. provides no reason to seek coating art. Consequently, Berkman should not be used to cure the deficiencies of Chen et al. or Chang.

Brown et al. is also non-analogous art because Brown et al. teaches wear resistant thermal print heads used to print images in paper and related media. A thermal print head is non-analogous art to a substrate support for a substrate-processing chamber. Furthermore, the print head does not have a substrate-receiving pocket that is sized to receive a substrate therein. One of ordinary skill in the art would not be motivated to use a coating used to reduce wear in a thermal print head to the art of reducing contamination from a pocket of a substrate support for a substrate processing chamber. Not only are the technical fields different, but the end application of reducing wear versus reducing contamination are also totally different. Further, Brown et al. teaches silicon-doped diamond-like carbon protective coatings not the claimed silicon nitride compound coating. Thus, Brown et al., also does not cure the deficiencies of Chen et al.

Todd teaches CVD synthesis of silicon nitride materials having low hydrogen content in microelectronics manufacture, and provides no teaching or motivation to apply a silicon nitride compound coating to a substrate support for a substrate processing chamber to reduce contamination of a substrate. A teaching to a method of fabricating a type of coating by CVD in the fabrication of IC chips, is not a teaching that can be applied to render obvious a substrate support component comprising a coating used to reduce contamination to hold a substrate. The reference provides no motivation or teaching that would cause one of ordinary skill in the art to apply the taught CVD method to the substrate support being claimed. Thus, Todd et al also does not teach or suggest the instant claims.

For these reasons, claims 1-5, 7, 8, 11-15 and 17 and not obvious over the cited combination of Chen et al. in view of Chang or Berkman et al., and Brown et al. or Todd. The Examiner is respectfully requested to reconsider this rejection.

II. Claims 6, 9 and 16 were rejected under 35 USC 103 (a) as being unpatentable over Chen in view of Chang or Beckman, and Brown or Todd as applied to claims 1-5, 7, 8, 11-15 and 17 above, and further in view of Burkhart et al. (US 6,469,283) or Tachikawa et al. (US 6,376,808).

The rejected claims 6, 9, and 16 are dependent upon parent claims 1 and 11. As explained above, the primary Chen et al. reference does not teach the claimed aluminum nitride ceramic block with a ceramic coating comprising an amorphous Si-H-N-O compound, or the claimed aluminum nitride ceramic block of claim 11 with a silicon nitride compound coating. Chen et al. provides not motivation to apply a coating to an exposed aluminum nitride block, and teaches that such a block can be used without problems in substrate fabrication, so Chen et al. motivates against use of a coating.

Chang makes no mention of the claimed amorphous Si-H-N-O compound of claim 1, or the claimed silicon nitride compound coating of claim 11, and instead

teaches a diamond film coating. Chang also teaches against use of a protective coating comprising silicon nitride.

Berkman's teachings to a protective coating of silicon nitride over a ceramic die crucible do not cure the deficiency of the lack of disclosure in Chen et al. or Chang because forming die crucibles is non-analogous art to the fabrication of substrate supports for substrate processing chambers.

Brown et al. also teaches a non-analogous art that comprises the fabrication of wear resistant thermal print heads with silicon-doped diamond-like carbon protective coatings. One of ordinary skill in the art would not seek coatings used to reduce wear in a thermal print head to reduce contamination from a substrate support for substrate processing chamber.

Todd generally teaches CVD synthesis of silicon nitride materials having low hydrogen content in the manufacture of micro electronic devices. Todd provides no teaching or motivation to apply an amorphous protective coating comprising Si-H-N-O compound as in claim 1, or a silicon nitride compound coating as in claim 11, to a substrate support for substrate processing chamber to reduce contamination of the substrate placed on the chamber.

Burkhart et al. does not cure the deficiencies of the Chen in view of Chang or Beckman, and Brown or Todd, because Burkhart et al. makes no mention of a protective coating for the heater. Nor does Burkhart et al. teach or suggest the claimed ceramic coating comprising an amorphous Si-H-N-O compound or a silicon nitride compound coating on a ceramic block of a substrate support. Thus Burkhart et al. does not provide the motivation to combine the disclosed heater with a protective coating used in the manufacture of a thermal print head as taught by Brown et al., nor a micro electronic device as taught by Todd.

Tachikawa et al. does not cure the deficiencies of the Chen in view of

Chang or Beckman, and Brown or Todd, because Tachikawa et al. teaches a heating apparatus having a heater and an electrode, but does not teach or suggest the claimed ceramic coating comprising an amorphous Si-H-N-O compound (claim 1), or a silicon nitride compound coating (Claim 11), on a ceramic block comprising a resistant heater as claimed. Nor does Tachikawa et al. teach any motivation to provide the ceramic coating comprising amorphous SI-H-N-O compound, or silicon nitride compound, on a heating apparatus. Thus, Tachikawa et al. does render the present claims obvious with respect to Chen et al. In view of Chang or Beckman, and Brown or Todd.

For these reasons, the Examiner is respectfully requested to reconsider the rejection of claims 6, 9 and 16.

III. Claims 10, 18-24 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Chen in view of Chang or Berkman, and Brown or Todd as applied to claims 1-5, 7, 8, 11-15 and 17 above, and further in view of Ishii (US 5,851,298) or Hwang (US 6,009,831).

Claim 10

Rejected claim 10 is dependent upon parent claim 1, which recites, inter alia, a substrate support comprising an aluminum nitride ceramic block with a ceramic coating comprising an amorphous Si-H-N-O compound, a resistance heater in the ceramic block, and heater leads extending out of the ceramic block to conduct electrical power to the resistance heater.

Chen et al. does not teach the claimed aluminum nitride ceramic block of claim 1 with a ceramic coating comprising an amorphous Si-H-N-O compound, or suggest the desirability of a coating. Chang also makes no mention of the claimed amorphous Si-H-N-O compound and instead teaches a diamond film coating. Berkman's teachings to a protective coating of silicon nitride over a ceramic die crucible do not cure the deficiency of the lack of disclosure in Chen et al. or Chang, because

forming die crucibles is non-analogous art to the fabrication of substrate supports for substrate processing chambers. Brown et al. teaches wear resistant thermal print heads with silicon-doped diamond-like carbon protective coatings, which is also non-analogous art to a substrate support for a substrate-processing chamber. Todd generally teaches CVD synthesis of silicon nitride materials having low hydrogen content in the manufacture of micro electronic devices and provides no teaching or motivation to apply an amorphous protective coating comprising Si-H-N-O compound to a substrate support for substrate processing chamber.

Ishii teaches a heating apparatus having a heater and an electrode; however, Ishii does not teach or suggest the claimed ceramic coating comprising an amorphous Si-H-N-O compound. Hwang teaches a heating apparatus having a heater and an electrode; however, Hwang also does not teach or suggest the claimed ceramic coating comprising an amorphous Si-H-N-O compound.

Thus, the cited rejection of claim 10 based on Chen in view of Chang or Berkman, and Brown or Todd as applied to claims 1-5, 7, 8, 11-15 and 17, and further in view of Ishii or Hwang, should be reconsidered.

Claims 18-24

Claim 18 is to a substrate support for a substrate processing chamber, the substrate support comprising a block comprising a first ceramic and which has a substrate receiving pocket sized to receive a substrate, a peripheral ledge extending about the substrate receiving pocket, and side surfaces. A coating comprising a second ceramic that is a different ceramic than the first ceramic covers the substrate pocket and peripheral ledge. The second ceramic comprises an amorphous Si-H-N-O compound or silicon nitride compound. A resistance heater and gas energizer electrode are in the block, and electrode leads extend out of the block to conduct power to the resistance heater and gas energizer electrode.

Chen et al. does not teach a support comprising a block comprising a first ceramic comprising aluminum nitride and having a coating comprising a second ceramic that is a different ceramic than the first ceramic, the second coating comprising an amorphous Si-H-N-O compound or a silicon nitride compound. Chen et al. provides no teaching to the desirability of the claimed coatings or even that a coating is needed at all. Nor does Chen et al. teach a ceramic block composed of a first ceramic with a second ceramic coating. As acknowledged by the Examiner, Chen et al. also does not teach a second ceramic comprising an amorphous Si-H-N-O compound or a silicon nitride compound coating to reduce contamination arising from a first ceramic of aluminum nitride. In fact, Chen et al. provides no teaching a suggestion that a coating is desirable.

Chang does not support the deficiencies of Chen et al. because Chang also does not disclose a ceramic block comprising a first ceramic comprising aluminum nitride, and having a coating of a second ceramic comprising an amorphous Si-H-N-O or silicon nitride compound. Chang discloses a diamond coating on the body of a susceptor. Chang further teaches against a coating of silicon nitride by teaching that silicon nitride contaminates the chamber and has to be cleaned off the chamber walls. Furthermore, Chang does not teach a ceramic block that includes the resistance heater or heater leads extending out of the ceramic block to conduct electrical power to the resistance heater.

Berkman's teachings to a protective coating of silicon nitride over a ceramic die crucible do not cure the deficiency of the lack of motivation to seek a coating based on Chen et al. The art of forming die crucibles is non-analogous to the art of substrate supports for substrate processing chambers, thus, one of ordinary skill in the art would not seek out literature for the fabrication of die crucibles to cure a contamination problem in a substrate processing chamber.

Brown et al. teaches wear resistant thermal print heads with silicon-doped diamond-like carbon protective coatings that are used to print images in paper and

related media. Thermal print head technology is also non-analogous art to the claimed substrate support for a substrate-processing chamber.

Todd generally teaches CVD synthesis of silicon nitride materials containing low hydrogen content in microelectronics manufacture. However, Todd provides no teaching or motivation to apply a silicon nitride compound coating to a substrate support for a substrate processing chamber to reduce contamination of the substrate placed on the support in the chamber. Thus, Todd et al also does not teach or suggest the instant claims.

Ishii teaches a heating apparatus having a heater and an electrode, however, Ishii does not teach or suggest the claimed substrate support comprising a block of a first ceramic comprising aluminum nitride with a coating of the second ceramic that is a different ceramic and that comprises amorphous Si-H-N-O compound or silicon nitride compound.

Hwang teaches a heating apparatus having a heater and an electrode; however, Hwang also does not teach or suggest the claimed substrate support comprising a block of a first ceramic comprising aluminum nitride with a coating of the second ceramic that is a different ceramic and that comprises amorphous Si-H-N-O compound or silicon nitride compound.

For these reasons, claims 18 to 24 are not obvious over the cited combination of Chen et al. in view of Chang or Berkman et al., and Brown et al. or Todd and further in view of Ishii or Hwang. Thus, the Examiner is respectfully requested to reconsider this rejection.

CONCLUSION

The above-discussed amendments are believed to place the present application in condition for allowance. Should the Examiner have any questions regarding the above remarks, the Examiner is requested to telephone Applicant's representative at the number listed below.

Respectfully submitted,
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Date: September 9, 2005 By: _____

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